

REMARKS

The application has been amended and is believed to be in condition for allowance.

Claims 6-8 and 14 were indicated to be directed to allowable subject matter.

Claims 3-8 and 11-14 were objected to due to an informality in claims 3 and 11.

The claims have been amended to remedy the stated basis of objection. Withdrawal of the objection is therefore solicited.

Claims 4 and 12 have been amended to be in independent form. Claims 1-3 and 9-11 have been cancelled. Claims 4-8 and 12-14 remain pending.

New claims have been added, their recitations based on the original claims and the disclosure of published application paragraphs [0054] - [0055].

New claim 15 recites that said loop controller, after substituting the execution of the instruction previously done by said specific loop, diagnoses said specific loop by identifying a faulty one device out of a plurality of possibly faulty devices connected to said specific loop. Similarly, new claim 16 recites that at said loop control step, after substituting the execution of the instruction previously done by said specific loop, said specific loop is diagnosed by identifying a faulty one device out of a plurality of possibly faulty devices connected to said specific loop.

New independent claim 17 recites that said loop controller, after substituting the execution of the instruction previously done by said specific loop, diagnoses said specific loop to determine which one disk of plural said disks connected to said specific loop is suspected of having the detected abnormality. New claim 18 recites that said loop controller diagnoses the one disk by issuing a group of commands for loop diagnosis of all the disks connected to said specific loop, and said commands analyzes the circumstances of the occurrence of the loop abnormality, and specifies said one disk suspected of having invited the abnormality.

Substantive Rejection

Claims 1, 3-5, 9 and 11-13 were rejected as anticipated by BURTON et al. 6,601,128.

Claims 4 and 12 are not anticipated.

BURTON Figure 1 is reproduced below. With reference to the BURTON Abstract, see that BURTON discloses (emphasis added) "selecting a path to one of at least two controllers. Path information is received from the controllers indicating a preferred controller to use to access each storage area. The path information to the storage controllers providing access to the storage areas is encoded with information designating one controller as the preferred controller and another as a non-preferred controller. The encoded path information is returned to a requesting computer. The requesting computer initially sends an

input/output (I/O) command to the preferred controller and sends the I/O command to the non-preferred controller if the preferred controller cannot execute the I/O command."

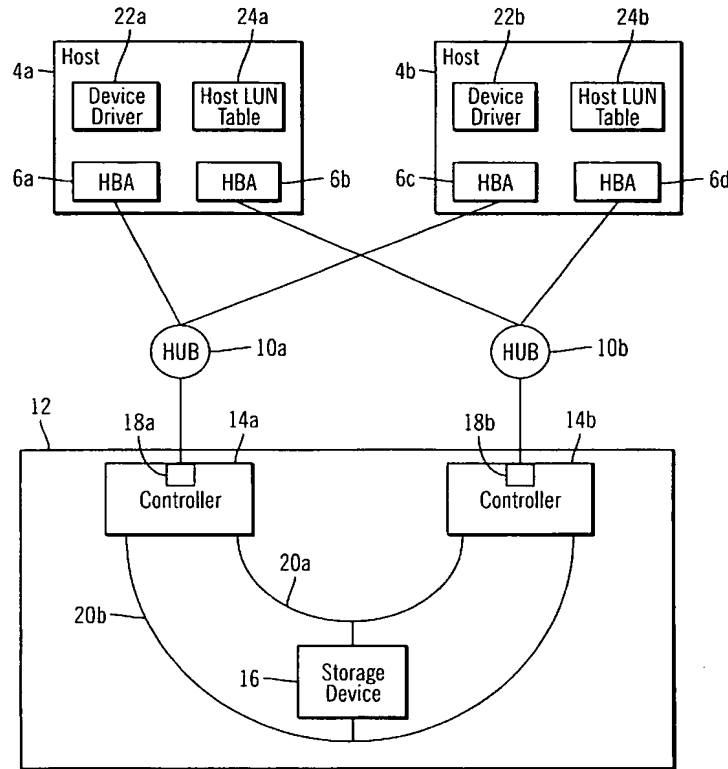


FIG. 1

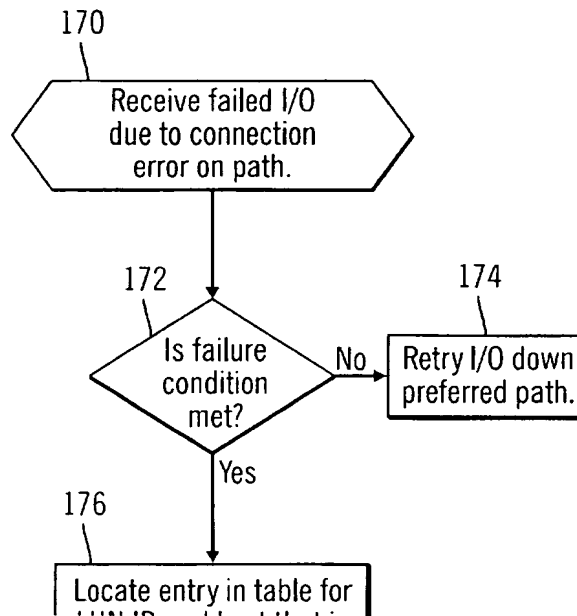
Claims 4 and 12 require that "said loop controller, after substituting the execution of the instruction previously done by said specific loop, diagnoses said specific loop" (claim 4).

Although BURTON may detect an abnormality, BURTON is not a loop diagnosis system.

BURTON makes no teaching with respect to diagnosing, and in particular no teaching with respect to a loop controller,

after substituting the execution of the instruction previously done by said specific loop, diagnosing the specific loop.

The Official Action offered Figure 5, step 172 as diagnosing the first loop.



See the disclosure beginning at line 64 of column 5, wherein it is disclosed that if the host 4a, b receives a message indicating that an I/O failed at block 170, then the device driver 22a, b will check (at block 172) for a failure condition, e.g., whether there have already been the maximum number of consecutive failed retries for a given I/O command. If the failure condition is not met, then the device driver 22a, b will retry (at block 174) the I/O operation down the preferred path. Otherwise, the device driver 22a, b will locate (at block 176) an entry in the LUN path table 24a, b for the target LUN ID and initiating host having the non-preferred path.

Thus, step 172 only verifies (confirms) a failure condition. There is no diagnosis performed. See that "Diagnosis" is defined as identifying the nature or cause of some phenomenon (WordNet® 2.1, © 2005 Princeton University). BURTON does not determine what has failed or why there was a failure.

In contrast, the present invention (see published paragraph [0054]) provides that the virtually degenerate disk control unit A71 performs processing to identify the faulty one out of a plurality of devices connected to the FC-AL loop A41 (loop diagnosis) (see S7 in FIG. 3). See paragraph [0055] disclosing that the disk control unit A71 issues a group of commands for loop diagnosis to all the FC-AL disks 21 through 2N connected to the FC-AL loops A41 and B42. The disk control unit A71 analyzes the circumstances of the occurrence of the loop abnormality, and specifies a disk suspected of having invited the abnormality (see S7 in FIG. 3). This allows the loop connection control unit A31 to sever the FC-AL disk 22 from the FC-AL loop A41 as shown in FIG. 2 (see S8 in FIG. 3).

BURTON makes no teachings or suggestions in this regard. Thus, claims 4, 12, 15-18 are each believed allowable for being individually novel and non-obvious.

Summary

A feature of the claimed structure of the present invention as defined by claim 4 lies in a loop controller, after substituting the execution of an instruction previously done by a

specific loop, diagnoses the specific loop. A claimed feature of the method of the present invention as defined by claim 12 lies in a loop control step, in which, after substituting the execution of an instruction previously done by a specific loop, the specific loop is diagnosed. With such a loop controller or a loop control step, a system simultaneously executes the instructions by using the substituted loop and identifies a failed storage media by diagnosing the specific loop of the remaining loops in which any abnormality is detected.

BURTON does not disclose this feature. Rather, BURTON discloses a system for selecting a preferred controller 14a or a non-preferred controller 14b to access a storage device 16. In BURTON, only a single storage device 16 is disclosed, and the storage device 16 is never diagnosed or severed. A step 172 indicates not a diagnosis but an error detection. This is because BURTON merely intends to minimize any delays necessitated by cross-communication between the storage controllers 14, b. Therefore, BURTON neither teaches nor suggests the claimed loop controller or loop control step of the present invention.

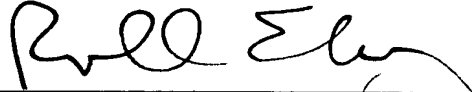
In view of the present amendment and the foregoing remarks, therefore, it is believed that this application has been placed in condition for allowance, and reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional
fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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